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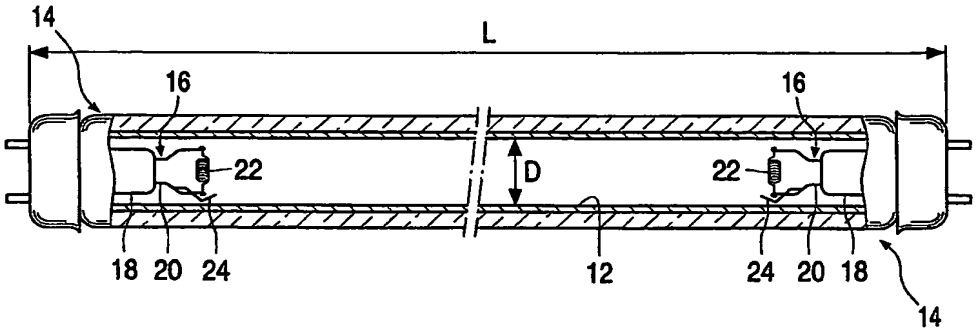
(54) Title: FLUORESCENT LAMP



(57) Abstract: A fluorescent lamp comprising a discharge vessel with two ends defining a discharge path extending between a pair of discharge electrodes provided at both ends of said discharge vessel for discharging electrons to and from each other; and a ballast circuit for operating the lamp in a normal lighting mode and in a dimmed lighting mode, with the special feature that the ballast circuit comprises a first ballast for supplying a normal operating current to said pair of discharge electrodes in the normal lighting mode; and a second ballast for supplying a reduced operating current to an auxiliary discharge electrode connected to a discharge electrode of said pair of discharge electrodes in the dimmed lighting mode.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Fluorescent lamp

The invention relates to a fluorescent lamp comprising

- a discharge vessel with two ends defining a discharge path extending between said ends;
- a pair of discharge electrodes provided at both ends of said discharge vessel for discharging electrons to and from each other; and
- a ballast circuit for operating the lamp in a normal lighting mode and a dimmed lighting mode.

Such a fluorescent lamp is known and has been on the market for some years. In this known fluorescent lamp, the ballast circuit comprises two ballasts, wherein the first ballast is connected to the mains and supplies a normal operating current to said pair of discharge electrodes in the normal lighting mode, and wherein the second ballast is fed by batteries and serves to supply a reduced operating current to said pair of discharge electrodes in the dimmed lighting mode. The dimmed lighting mode is a so-called emergency light mode. However, in order to use as few batteries as possible, said pair of electrodes are not additionally heated in the dimmed lighting mode, so that a normal discharge of electrons in the discharge vessel is not achieved, resulting in a shorter life of the known fluorescent lamp. Furthermore, the known fluorescent uses a so-called cold start for igniting the lamp. That means that in a very short time a high voltage is applied across the fluorescent lamp. However, as the electrodes are not preheated and therefore cold, sputtering of the electrode(s) will take place, resulting in a relatively short switching life.

It is the object of the invention to avoid the above-mentioned disadvantages of the prior art, i.e. to provide an improved fluorescent lamp with a longer life, and to that end a fluorescent lamp of the type mentioned in the preamble is characterized in that the ballast circuit comprises

- a first ballast for supplying a normal operating current to said pair of discharge electrodes in the normal lighting mode; and
- a second ballast for supplying a reduced operating current to an auxiliary discharge electrode connected to a discharge electrode of said pair of discharge electrodes in the dimmed lighting mode.

Preferably, the auxiliary electrode is connected by its one end to an electrode of said pair of electrodes.

After a cold start of the fluorescent lamp in the dimmed lighting mode the relatively small auxiliary electrode will warm up first, so that a discharge of electrons (thermal emission) will soon be established. This quick warming up can be enhanced in that the thermal capacity of the auxiliary electrode is kept as low as possible. To maintain the discharge of electrons in the dimmed lighting mode, the diameter of the auxiliary electrode should be small. After a start in the normal lighting mode the pair of electrodes will first be preheated by the first ballast, after which a normal operating current will cause a discharge of electrons (thermal emission).

The invention will be elucidated further with the help of a drawing, in which

Fig. 1 is a partially broken-away side view of a fluorescent lamp in a preferred embodiment according to the invention; and

Fig. 2 is a detail of Fig. 1.

In Fig. 1, a fluorescent lamp is shown provided with a discharge vessel 10 defining a discharge path. The inner surface of the discharge vessel 10 is coated with a coating 12 of a fluorescent material. The discharge vessel 10 is hermetically closed at both ends by mounts 14, with a pair 16 of discharge electrodes 20 mounted on each mount 14. Electrons are discharged from one pair 16 of electrodes 20 to the other and vice versa, along the axis of the discharge vessel 10. The electrodes 20 protrude into the discharge vessel 10 from a stem 18 of the mount 14. A filament 22 coated with an electron-emitting material bridges the electrodes 20 of each pair 16. An auxiliary electrode 24 in the form of a coiled wire is connected at one end to an electrode 20 of a pair 16 of electrodes 20 (see Fig. 2).

For normal (general) lighting operation, the fluorescent lamp only uses the electrodes 20 of each pair 16, preheated by a first ballast. For dimmed (emergency) lighting

operation, only the relatively small auxiliary electrode 24 is used, operated by a second ballast during a cold start.

CLAIMS:

1. A fluorescent lamp comprising a discharge vessel with two ends defining a discharge path extending between said ends;

- a pair of discharge electrodes provided at both ends of said discharge vessel for discharging electrons to and from each other; and
- a ballast circuit for operating the lamp in a normal lighting mode and in a dimmed lighting mode, characterized in that the ballast circuit comprises
- a first ballast for supplying a normal operating current to said pair of discharge electrodes in the normal lighting mode; and
- a second ballast for supplying a reduced operating current to an auxiliary discharge electrode connected to a discharge electrode of said pair of discharge electrodes in the dimmed lighting mode.

2. A fluorescent lamp according to claim 1, wherein the auxiliary discharge electrode is shaped as a coiled wire.

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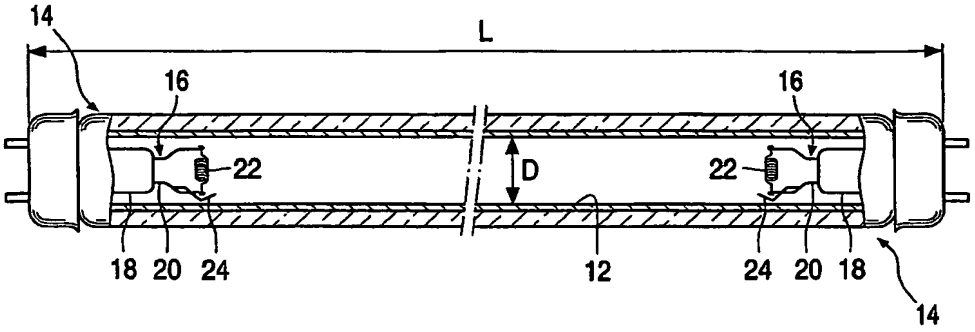

FIG. 1

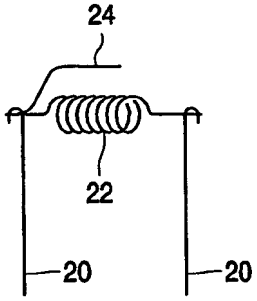

FIG. 2